REMARKS

In paragraph 2 of the Action, claims 1-6 [sic. 1-4 and 6] were rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al. in view of Hallock and Plut et al.

In view of the rejection, claims 1 and 6 have been amended to clarify the features of the invention, and new claims 7 and 8 have been filed.

A fluoroscopy image apparatus of the invention basically comprises two-dimensional radiation sensor arrays formed of photoelectric conversion elements for outputting charge signals corresponding to an incident amount of radiation, switches arranged in a matrix form under the radiation sensor arrays and connected to the photoelectric conversion elements, a gate drive circuit connected to the switches for turning on the respective switches in case of reading out the charge signals, a readout amplifying circuit connected to the sensor arrays for reading out the charge signals stored in respective pixels, and a control circuit connected to the gate driver circuit and the readout amplifying circuit for controlling the same. This basic structure is known in the art, as shown in Fig. 3 of the application.

The fluoroscopy image apparatus of the invention further includes a digital-to-analog switching circuit connected to the control circuit for switching between a digital video control and an analog video control so as to use one of the controls, a TV reference signal circuit connected to the control circuit and the gate drive circuit for controlling the gate drive circuit in the analog video control, and a picture signal superimpose circuit connected to the TV reference signal circuit and the readout amplifying circuit. The TV reference signal circuit includes a horizontal scanning/synchronization pulse waveform generating

circuit and a vertical scanning/synchronization pulse waveform generating circuit.

Upon actuating the analog video control, the gate driver circuit is driven by the signals from the TV reference signal circuit for taking out picture signals from the radiation sensor arrays through the readout amplifying circuit, and the picture signal superimpose circuit superimposes the picture signals on the signals from the TV reference signal circuit by synchronizing with the signals from the TV reference signal circuit to thereby output a TV analog video signal.

The fluoroscopy image apparatus of the invention is generally operated by the digital video control to provide good image, as in the conventional apparatus. However, if the control circuit does not operate properly, the conventional apparatus can not be used. Therefore, the fluoroscopy image apparatus of the invention includes, in addition to the conventional structure for the digital video control, the digital-to-analog switching circuit, the TV reference signal circuit, and the picture signal superimpose circuit for the analog video control. Thus, the apparatus of the invention can be operated by analog video control even if the digital video control does not operate. The fluoroscopy image apparatus of the invention is, therefore, very reliable.

In Yamada et al., a radiation detector includes an X-ray tube 11, an X-ray solid flat panel detector 33 including TFTs 41 and multiplexer 61, a CRT 25 and a control system including an X-ray irradiation condition selecting portion 19, an analog SW setting portion and an image memory. With reference to X-ray irradiation condition, signals from the flat panel detector 33 and so on, the radiation detector is controlled to provide the image on the CRT 25. Yamada et al. discloses the radiation detector by the digital video control only.

In the invention, the apparatus includes, in addition to the digital video control as used in Yamada et al., the digital-to-analog switching circuit connected to the control circuit for switching between the digital video control and the analog video control, the TV reference signal circuit connected to the control circuit, and the picture signal superimpose circuit. The circuits for analog video control as stated above are not disclosed or suggested in Yamada et al.

Therefore, Yamada et al. does not disclose or even suggest the features of the invention.

Hallock relates to an interface for a video source such as video displayer connected to a video display processor (DVP) to overlay a picture with graphics. The DVP 150 operates in two modes, i.e. graphics and external video. The DVP 150 receives data and control information on data and control buses from a communication interface 140, returns interrupts and other signals to interface 140, and supplies its composite video output to a display device 170. In the external video mode, the composite video signal received from a video signal source 103 is provided with an overlay in accordance with user defined inputs received from interface 140.

In the invention, the digital-to-analog switching circuit is connected to the control circuit for switching between the digital video control and the analog video control so as to use one of the controls. In Hallock, the graphic and external video modes can be selected, but switching between the digital video control and the analog video control is not made.

In the invention, when the digital video mode does not operate properly, the TV reference signal circuit and the picture signal superimpose circuit are actuated to provide the image on the image sensor to the display by the analog video control. In Hallock, two different kinds of signals are matched by the DVP and displayed,

but the signal from the image sensor is not superimposed on the TV reference signals.

In the invention, the TV reference signal circuit is connected to the gate drive circuit for controlling the gate drive circuit in the analog video control. In Hallock, however, such a control system is not disclosed or suggested.

Hallock discloses the interface for two signals, but the interface in Hallock does not disclose or suggest the features of the invention.

In Plut et al., the television camera provides, in a digital image acquisition operating mode, an analog video signal to be digitized, stored and processed; in a fluoroscopic mode, a continuous television picture of the image tube output; and in an analog verification mode, a real time image for verifying that a proper radiation exposure or series of exposures has taken place. In the invention, the digital control is generally used, but when the digital control can not be operated properly, the TV reference signal circuit is actuated to operate the gate driver circuit and the picture signal superimpose circuit to obtain the image through the analog video control. The system of the invention is not disclosed or suggested by Plut et al.

As explained above, the cited references do not disclose or suggest the features of the invention. Even if the cited references are combined, it is not disclosed or suggested that the TV reference signal circuit controls the gate driver circuit and obtain the image by the analog video control. The features of the invention are not obvious from the cited references.

Reconsideration and allowance are earnestly solicited.

Respectfully Submitted,

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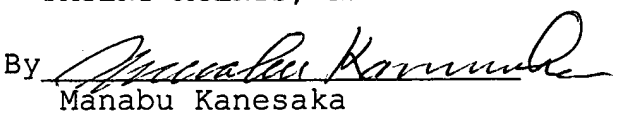
By 
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